2.0 DESCRIPTION OF THE PROPOSED ACTION AND ALTERNATIVES

2.1 PROPOSED ACTION

4 to 10 mrem/yr Radionuclide Loading Planning level Increase

DOE proposes to raise the biosolids land application loading limits for radionuclides from the current, self-imposed planning levels based upon 4 mrem/yr, 365-day homesteader (i.e., constant site occupancy) to 10 mrem/yr, 365-day homesteader. For consistency and the purposes of assessing specific impacts, the same assumptions and pathways utilized in the previous RESRAD modeling will be used in determining biosolids and application site soil planning levels. Land application planning levels for known radionuclides in the city sewer system (e.g., Uranium, Cobalt-60, Cesium-137) and others that were not previously modeled but have the possibility of demonstrating detectable levels (e.g., Strontium-90 and Europium-154) have been developed using a maximum reference dose of 10 mrem/yr and resulting planning levels are available in additional technical support documentation (Performance Technology Group 2001) that will be made available for review at the DOE Public Reading Room. Strontium-90 and Europium-154 have recently been identified in ORNL biosolids and have been included in the updated RESRAD modeling for 10 mrem/yr planning levels. Radionuclides (Plutonium-238, Neptunium-237, etc.) that have not shown detectable levels having established biosolids and site soil planning levels will remain at the 4 mrem/yr levels because the need to raise the respective levels does not exist. ***Table D.3.*** of the 10 mrem/yr RESRAD modeling (***Appendix D***) summarizes the applicable calculated dose-based planning levels. The planning level of each radionuclide listed in the RESRAD modeling corresponds to a 10 mrem/year cumulative dose planning level to the maximally exposed individual.

West End Treatment Facility Effluents

DOE also proposes the addition of the Y-12 Plant West End Treatment Facility (WETF) treated effluent discharges into the Y-12 and City of Oak Ridge sewer systems. This alternative is viable because of the removal of listed hazardous wastes (i.e., Non-RCRA coding) after treatment and the extensive tank clean out effort conducted in recent years at WETF. In addition, by adding equipment modifications such as the neutralization reaction tank thereby increasing the removal efficiency of heavy metals, nitrates and organic compounds, residual contaminant levels are very low and may not require the level of treatment provided by the Effluent Polishing System (EPS).

Since contaminant levels are very low, DOE proposes to provide a controlled, monitored discharge to the Y-12 Sanitary Sewer System for WETF wastewaters that have undergone treatment and can demonstrate compliance with proposed monthly sewer system discharge criteria (***Table B.12 in Appendix B***) as established by BWXT and the City of Oak Ridge. Because both the City of Oak Ridge and WETF wastewater treatment plants discharge to the same tributary, East Fork Poplar Creek (EFPC), but at different points in the stream, the flow of effluent is the same whether they were discharged directly from WETF or the City of Oak Ridge POTW. It is assumed that because heavy metals and radionuclides typically weigh more than other contaminants found in WETF wastewaters, these materials would settle in the biosolids treatment process at the city POTW and be land applied on the ORR land application sites. *A very small portion of the total uranium (i.e., maximum 7.56 kg per year) that would have been shipped off site as WETF process residuals to a commercial disposal facility would be land applied on the ORR application sites.* The specific impacts of this increase are discussed in ***Section 4.1***.

Based upon assumptions utilized in the WETF Sanitary Sewer Assessment (WSMS 2000), it would take approximately 70 days to discharge a 500,000-gallon tank at 5 gpm, 24 hours per day, 7 days per week.

Figure 2.1 displays the proposed flow diagram for WETF discharges to the Y-12 Sanitary Sewer System and NPDES outfall. Each batch of treated 500,000 gallon WETF effluent will be collected in Tank F-8, sampled and analyzed for a total of 165 pollutants to include heavy metals, radionuclides, organic compounds, pesticides and PCBs prior to discharge to the sewer system.

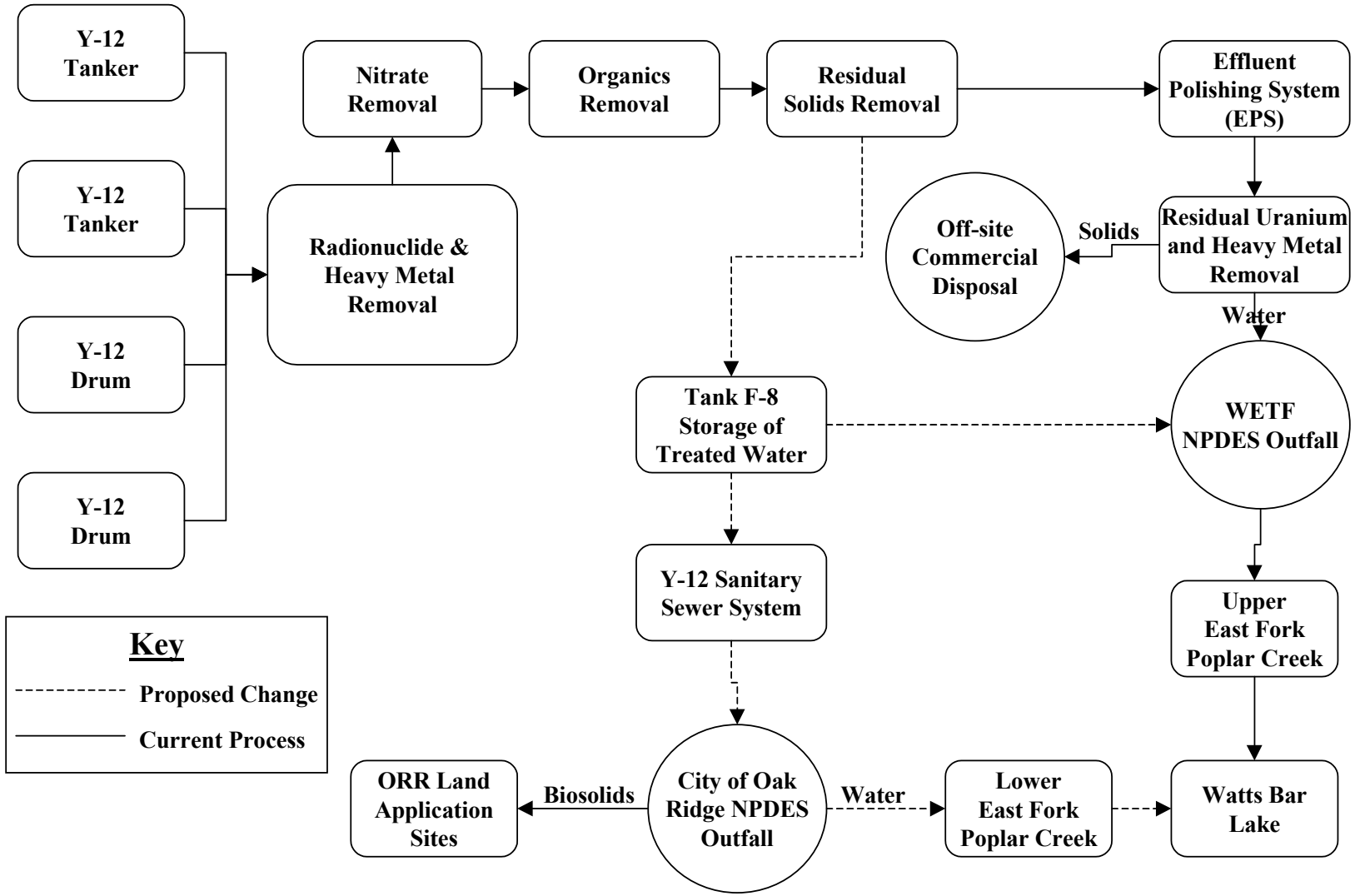
After analytical results have been received, the BWXT Sanitary Sewer Compliance Coordinator will be contacted requesting approval to discharge the analyzed WETF effluent to the sewer system, provided all contaminant parameters (***See Appendix B, Table B.12***) are met. The BWXT sewer coordinator will issue approval to discharge at a specific rate for a finite period of time. In times of unforeseen emergency or other circumstances that may be warranted, the discharges to the sewer system will be immediately halted upon notification by BWXT compliance personnel.

Batches can remain in storage until discharges are allowed to resume or can be pumped directly to the existing NPDES discharge point, provided compliance can be demonstrated with NPDES discharge criteria.

Batches that fail any established sanitary sewer discharge criteria will receive additional treatment through the appropriate operable unit at WETF, for example, if elevated nitrates are found in the treated wastewater stored in Tank F-8, the water will be pumped to the biodenitrification units to destroy the residual nitrate compounds. Wastewaters that receive further treatment will be re-sampled and analyzed to determine compliance with established sanitary sewer criteria prior to discharge.

A suitable, existing discharge point to the sanitary sewer system is located within 100 feet of the proposed WETF treated water holding tank F-8. To accommodate the discharge of treated WETF wastewaters to the Y-12 Sanitary Sewer System, a small amount (less than 100 feet) of underground sewer piping and new manhole cover will need to be installed before discharges can commence.

Figure 2.1. Proposed Sanitary Sewer Discharges from the West End Treatment Facility to the Sanitary Sewer System



2.2 PROPOSED ALTERNATIVES

2.2.1 Raising the ORR Biosolids Land Application radionuclide planning levels from 4 mrem/yr to 10 mrem/yr and not allowing the addition of WETF effluents into the sanitary sewer system

This alternative would allow raising the current ORR land application planning levels from 4 mrem/yr to 10 mrem/yr, but without the addition of WETF effluents into the Y-12 and City of Oak Ridge sanitary sewer systems. Normal land application activities would continue at all active sites. The City of Oak Ridge would recalculate available radionuclide capacities based upon the 10 mrem/yr modeled planning levels and would revise radionuclide acceptance levels for the POTW. The absence of WETF effluents in the sewer system would result in a slightly higher POTW contaminant capacity for nickel and uranium. As new commercial industries that have needs with regards to radionuclide discharge to the sewer system are identified, the City of Oak Ridge would assess potential maximum discharges and issue radionuclide limits based upon "worst-case" modeling scenarios and available capacity, as previously discussed. Biosolids land application site soils would continue to be closely monitored, as performed in the current scope of POTW operations.

WETF would continue to operate under its present configuration which would include treatment through EPS and discharge of effluents through the NPDES outfall to EFPC. The estimated cost savings of $133,000 projected in the sanitary sewer assessment (WSMS 2000) would not be realized. BWXT would not need to revise the existing Y-12 Plant Industrial Discharge Permit (IDP) to accommodate WETF effluents for total uranium and nickel. This would result in a maximum reduction of 41 g per day (1,260 g per month) for total uranium and 1.2 g per day (38 g per month) for nickel for 4 months of the entire 12 month calendar year.

2.2.2 No Action

The no-action alternative provides an environmental baseline with which impacts of the proposed action and alternatives can be compared. Under the no-action alternative, ORR biosolids land application radionuclide loading limits would remain at a 4 mrem/yr dose and WETF effluents would not be allowed to be discharged into the sanitary sewer system.

Because of the limited radionuclide capacity available for new industrial growth, any one or a combination of the following actions could be utilized:

1. Industries currently discharging even minimal amounts of radionuclides to the sanitary sewer system could be severely restricted or denied to allow for some radionuclide capacity;

2. Industries currently discharging could discharge radionuclide at permitted levels allowing no room for future industrial growth; and

3. The city could leave the ORR land application sites in favor of freely distributing the treated biosolids material to public outlets consistent with EPA regulations.

Also, present and future DOE sanitary wastewaters and biosolids bearing any level of radionuclides requiring treatment in all likelihood, would not be accepted at the city POTW, forcing DOE to explore other more costly treatment alternatives for their sanitary wastewaters. The acceptance and treatment of ORNL biosolids could also be discontinued, since there are no other sanitary sludge disposal options remaining, ORNL biosolids would be managed as low-level radioactive waste, resulting in an additional cost of approximately $67,000 per year (Arp 2001) for DOE. Future DOE projects could also be impacted by not accepting biosolids or wastewaters originating from the ETTP site. The amount and type of contaminants from industries currently at the ETTP site and future industries could be limited to treatment capacity of the on-site wastewater treatment plant, which at the present, is somewhat limited. This could have an impact upon new industries locating at the ETTP site and the potential presence of radionuclides in their respective effluents.

WETF would continue to operate under its present configuration, which would include treatment through EPS and discharge of effluents through the NPDES outfall to EFPC. An estimated cost savings of $133,000 projected in the Sanitary Sewer Assessment (WSMS 2000) would not be realized. BWXT would not need to revise the existing Y-12 Plant IDP to accommodate WETF effluents for total uranium and nickel. This would result in a maximum reduction of 41 g per day (1,260 g per month) for total uranium and 1.2 g per day (38 g per month) for nickel for 4 months of the entire 12 month calendar year.